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Does MS Photo Story 3 make a difference? The views and experiences of a group of Norwegian secondary school teachers

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Abstract

This paper examines views and attitudes of secondary school teachers on the role of MS Photostory 3 as a learning-enhancing artifact. The examination is based on the analysis of empirical data, collected from an ongoing project involving teachers and pupils at a Norwegian secondary school. Two teams, numbering a total of 9 teachers, participated in training programs from August 2007 to June 2009, with the objective of enhancing the teachers' ICT competence. They agreed to use MS Photo Story 3 as a presentation tool in a number of subjects for a period of two years. In parallel with conducting training programs for the teachers, qualitative data describing teachers' views and attitudes were collected during regularly conducted focus-group interviews with teacher teams, by studying teacher-produced reflection notes and by participant observations of teachers and pupils in classroom activities. A main finding is that it was necessary to upgrade the teachers' computer skills on a very basic level in order to give the teachers confidence

to use ICT in their teaching. Insufficient ICT competence and low confidence among the participating teachers has considerably hampered the utilization of the ICT's learning potential.

Keywords: MS Photo Story 3, Knowledge creation, Information and Communication Technology, Norway

Introduction

During the past decade, Norway and many other countries have experienced that efforts to integrate information and communication technology (ICT) into most aspects of school practice has received massive attention. The underlying motives for this focus on ICT applications in schools and colleges are three-fold. Firstly it is believed that ICT can contribute to a more rational organizing and running of educational institutions which is comparable with the motives of introducing ICT systems in private and public enterprises. Secondly it is widely accepted that competence in handling ICT is a required and important asset of citizens in modern society. Digital literacy is considered important and equal to other more traditional competences such as reading, writing and mathematics. This view is clearly reflected, among other places, in the white paper no. 30 to the Norwegian parliament (2003-2004), "Culture for Learning" ,which emphasizes that achieving digital literacy is a goal in itself and pupils in elementary and secondary schools should receive systematic training in the use of ICT. Thirdly, the plans for introducing ICT in Norwegian schools is motivated by the assumption that the active use of ICT is not only a goal in itself but a means of supporting pedagogical processes which will contribute to an enhancement of learning outcome in most subjects. The view that ICT represents a very powerful tool for supporting learning is deeply rooted in many professional environments and cultures but most apparent in the informatics and computer science disciplines. In particular with the introduction of the internet in the 1990s, the belief in modern technology, as a kind of miracle cure for the enhancement of learning, increased considerably. However, despite the enthusiasm, the learning-enhancing effects of ICT-supported learning processes on subject learning outcome is still not convincingly verified and reported. A common and frequently-phrased explanation of the apparent failure to obtain more clearly and measurable positive effects of ICT supported learning is that the approach can be characterized as "technology driven" and resembles a "solution seeks problem" process. The development and implementation of ICT in learning situations has failed to involve appropriate changes in pedagogy, the organizing of learning processes and the inclusion of the teachers and pupils as system users. This unbalanced approach to developing, implementing and using ICT-based systems is paralleled to experience from traditional system- development processes conducted during the past few decades. Failure to involve and understand the system users is believed to be a major explanation of the many unsuccessful ICT projects in the past. In view of the criticism of the unbalanced implementation and use of ICT-supported learning systems and the large amount of resources used to promote the use of ICT in schools, it is of great importance to gain more insight into and a better understanding of ICT-supported learning processes. In particular it is of paramount interest to investigate and examine the role of school teachers as both ICT-system users and mentors for learners involved in ICT supported learning processes.

The knowledge-creation perspective and MS Photo Story 3

The present project encourages teachers to let pupils apply MS Photo Story 3 for creating presentations in most school subjects. We had in beforehand discussed ICT issues with the teachers and agreed that they should be supplied with software which allowed the pupils to create their own presentations and MS Photo Story 3 is a powerful tool for video productions with a simple and user friendly interface.

Based on previous and ongoing research there is clear evidence supporting the view that subject learning can be considerably enhanced by emphasizing the knowledge-creation perspective (Dons & Bakken, 2003; Hennessy, Ruthven & Brindley, 2005). It is also reason to believe that learners enhance their digital literacy by being producers and not just consumers of digital media content. Being a knowledge creator implies that the learner is a producer on two levels: both as an active knowledge constructor according to constructivist learning theories and as a producer of digital representations. In relation to this perspective, Papert's notion of *constructionism* is highly relevant. Based on the work of Piaget, Dewey and Montessori he proposed a theory of constructionism stating that children learn best when they are in the active role of designer or constructor (Harel & Papert, 1991). This view is supported by Barak (2006), who argues that ICT technology offers powerful tools for supporting these principles and points out that teachers should see computer technologies as a means of supporting knowledge discovery and construction, rather than letting the learner be a passive receiver of knowledge transferred from teachers.

The learning perspective in the present project is simply that knowledge is actively created through relating to others and acting in the world (Ackermann, 2004). Thus we are working in a socio-cultural learning perspective. We see learning as an active and social process where the learner builds new knowledge based on previous knowledge in interaction with the environment. In this perspective project work is a central learning method. Project work emphasizes the active creation of knowledge as opposed to a more passive transfer of knowledge from teacher to learner. Dons and Bakken (2003) find that pupils attain improved subject knowledge when assigned to communicate their knowledge to fellow pupils by creating video or animation presentations. They argue that the learners are motivated to obtain a deeper understanding of the subject matter when creating a digital multimodal presentation to be studied and observed by peers.

Research design

The project referred to in this paper is conducted as a partnership project involving Hedmark University College, a local secondary school and the municipal educational authorities. Using ICT for supporting subject teaching and learning as well as enhancing pupils' ICT competence has been given high priority by the participating school, and the school represents a culture, characterized by a more-than-average supportive attitude towards ICT as a learning tool and the participating teachers were more-than-average enthusiastic. The project design has been developed together with the involved teachers and the headmaster at the school. In addition the municipal educational authorities have been part of the planning and function as part of a reference group. The teachers agreed to try out and reflect on the use of ICT in subject learning and in particular try out MS Photo Story 3. A project group including team leaders at the school and two researchers planned all intervention and it was of paramount importance that the actions were integrated in the school's teaching plans and curriculum. In this context it is

important to emphasize that Norwegian secondary schools differ considerably from secondary schools in most other European countries. In Norwegian schools the curriculum is subject-specific, as it is in many other countries but teaching is normally organized cross-curricular. Since the teachers are organized in cross-curricular teams they are mutually influenced by each other across subject-related traditions.

The Microsoft Photo Story 3 software was introduced to the teachers early during the action, encouraging them to apply this as a presentation tool. Ms Photo Story 3 is a presentation software which enables the learners to present their work as short movies with pictures, music and recorded text. Before the school year started, training programs were conducted with the teachers involving digital storytelling as a particular genre in addition to general software training. At the start of the project the majority of the teachers had a very enthusiastic attitude towards the idea of ICT- supported learning but gradually they became more reluctant to the whole project and at one stage almost negative. Many factors may explain these phenomena, but gradually it became apparent that the main problem was rooted in the lack of ICT competence among the teachers. This initiated a series of elementary upgrading courses offering training in basic ICT skills such as Windows office, file handling and internet ethics in order to boost both teachers' competence and confidence, which is considered as vital factors for the successful integration of ICT in their daily practice and planning.

The first phase of the empirical data gathering, starting in September, 2007, by conducting individual interviews with all teachers. Later in the term, focus-group meetings were used monthly in order to observe the teachers' attitude and discuss their experience with using MS Photo Story 3. The focus-group meetings lasted approximately 1.5 hours and with a few exemptions all the teachers attended the meetings and communicated their experience. During the meetings the teachers came up with different examples related to their own subjects and elaborated on what impact MS Photo Story 3 might have on teaching and learning in the subject in question. Between September 2007 and June 2009 two researchers conducted 20 individual teacher interviews and 10 focus-group interviews with the nine-member teacher teams. In addition, all members of the teacher teams and three members of the administration and teaching staff involved were encouraged to produce reflection notes, elaborating on particular experiences and their personal views.

Main outcomes and results

Approaching the task of describing teacher's attitudes and views based on the present project is to a large degree inspired by investigations and examinations conducted relatively recently by other researchers in the same field (Hennessy, Ruthven & Brindley 2005). It is however important to emphasize in this context that the theme categories are to a considerable degree interrelated and overlapping. This implies that discussions and references to teachers' perspectives on each theme do not rule out that the same arguments are relevant for one or more of the other themes.

However, before commenting on the teacher's present attitudes with respect to possible positive effects ICT has on pupils' understanding of subject issues, a few comments on the teachers' attitudes prior to the project action is required. And it is particularly important to emphasize that this is a matter of what they believed and expected and not based on results from exams or formal tests of pupils. And it became clear that teacher attitudes varied considerably and seem to be strongly related to teacher personality, teacher ICT competence, subject matters, as well as preferred learning style.

One of the science teachers expressed a very positive attitude:

> Last year the 9th graders were introduced to the use of spreadsheets (Excel) and this has been extended during the spring term to include exam problems in maths requiring the use of spread sheets. I consider this to be a useful tool for learning in maths, in particular with themes like statistics, production of graphs and diagrams, probability calculations, measurements (in science), calculations, economy etc.

But other teachers, also highly ICT competent, indicated a very different view, representing the opposite end of the positive-negative attitude dimension by clearly expressing that they believed little could be gained by using ICT for supporting learning in maths.

> So far I have not used ICT in maths. I don't see how this can be beneficial. I definitely don't think the use of ICT will result in better insight into subject problem areas.

Having quoted both the extreme optimistic and the extreme pessimistic or negative attitudes expressed by the teachers involved in this research process it is reasonable to state that; the prevailing teacher attitude on integrating ICT in learning processes can generally be characterized as reasonably sober. Most of the teachers involved seem to approach the question of pros and cons by integrating ICT in learning process with a slightly hesitant or "wait-and-see" perspective. However, all the participating teachers were aware of the expectations the national Norwegian educational authorities have with respect to the benefits of integrating ICT in learning processes, and teachers are continually making considerable efforts to find out or "crack the code" of how to utilize ICT when performing their ordinary teaching jobs.

ICT competence and confidence

The teachers' own ICT competence as well as confidence in applying ICT-supported learning seems to be of paramount importance for their attitude towards the usefulness of using ICT in subject teaching in generally and MS Photos Story 3 specifically. During the initial stages of the project the majority of the teachers considered themselves as not possessing the necessary ICT competence required for functioning as mentors for ICT-supported learning processes despite the fact that several of the teachers had previously received formal ICT training. A typically comment from the teachers was that they found it difficult to find time to enhance their personal ICT competence as the following quote illustrates:

> I am positive and not afraid of using ICT. I am always eager to learn something new and I find ICT important because we have a responsibility to give the pupils a varied approach to teaching and learning. I see the potential in ICT for varying my teaching practice.

At this stage of the project it became apparent that if the project was to continue as we had agreed with the teacher team we had to provide the teachers with the necessary ICT training. Most of the teachers, except 3, needed more ICT upgrading. Teachers' lack of ICT competence as well as confidence in the use of ICT turned out to be a major bottleneck in the project. The implementation process of ICT at our school had the same characteristics as the diffusion of artifacts known from other social systems. In the teams of teachers we had early adopters being very enthusiastic about this new tool and they immediately started to experiment with the technology. But so-called lagers were also observed. These needed to carefully observe how the technology worked for others before they considered taking the chance of implementing ICT in their own teaching practice. However, the majority of the

teachers adopted an attitude expressing that they could clearly see the potential and possibilities of ICT-supported learning but at the same time emphasized and pointed to numerous problems involved by using the new technology. These teachers wanted to use the technology more extensively, but first they had to "*get their classes through the curriculum*". Of the nine teachers involved only one was still refraining from using ICT for supporting learning processes after a year of project action. This was a teacher in Norwegian languages and it is known from other research that language subject teachers often don't see that that ICT will enhance the learning outcome in their subject (Ruthven, K. et.al, 2005).

Technical constraints

Especially during the initial stages of the project both organizational and technical constraints represented considerable obstructions. The secondary school is well equipped with both stationary computers, laptops and designated computer rooms and video projectors are available in each learning arena. However, severe technical problems were put forward by the teachers as main arguments for not using ICT in teaching. Due to unreliable ICT systems many teachers were reluctant to plan lessons using ICT. They felt that they always needed to have back-up plans in case the ICT systems did not work and the problems could be both technical and organizational. Typical comments were:

> Using ICT is increasing my workload because I always have to have a back-up plan due to the unstable ICT system at this school. In addition I spend a lot of time finding relevant rooms.

These types of comments on technical problems reached a peak a couple of months into the project. From this stage the frequency of comments on malfunctioning technology decreased considerably and during later focus group meetings all teachers agreed that technical problems were no longer an excuse for not planning to use ICT during lessons.

ICT gives us more and better learning material

Judging from interviews and observations all teachers consider Internet access as a valuable support for teaching and learning processes. The Ministry of Education and many publishers of school textbooks have during the past years developed a number of subject-relevant internet resources and some teachers recommend these web sites for the support of pupils' homework. In addition they also allow pupils to search and Google on Internet during classes.

Regarding the question of which categories of pupils benefit most from Internet support, some argue that for the cleverest pupils the Internet works well as an extra source of information but for the weaker pupils it is often too tempting to diverge to less-school relevant paths and become occupied with for example football results and internet games instead of school work. A typical statement which represents the teachers' initial view on this issue is the following:

> The best pupils are also better at using Internet as a source of information than the weaker pupils. Those who are skilled writers and readers and experienced in using for instance library resources are also the best at using computer support. The weaker pupils avoid libraries and are very quick to start the computer. However they get little done. The Norwegian schools are World Champions in searching the Internet, but what they get out of it in learning outcome is another question.

The teachers also claimed that in order to be an efficient learning resource the use of Internet must be planned and controlled by the teacher.

> The teacher must be the one who plans and decides how, where and when the pupils are to use the Internet. It is not the pupils who should be responsible for finding knowledge and learning resources on the Internet, it must be the teacher. It is meaningless for instance that a project period starts out with an internet search.

This quotation reflects the views of how most teachers presently consider the Internet as a learning-supporting artefact. They claim that the internet is useful but only if the teacher has made plans in advance for how to use it, which for instance means looking up relevant URLs and creating efficient search words. This however is a very time-consuming process for the teacher and often in conflict with efficiency requirements in school situations.

Despite considerable initial skepticism to what is the best use of time recourses in order to reach subject goals - reading textbooks, using the library or searching the Internet - most teachers gradually developed an increasingly positive attitude to the use of the Internet. One teacher even said that he knew that the Internet and ICT could help him to change from teacher-controlled to learner-centered classes and to practice a more constructivist-based pedagogic style. The teachers became less critical towards the pupils work on Internet because they have observed that the pupils worked more structured than they did in the beginning of the project. Internet search is important in combination with MS Photo Story 3 in order for the pupils to find relevant and updated information.

The work process and the product

When it comes to the use of Ms Photo Story 3 as a video presentation tool most teachers started out with a positive attitude and expressed that this tool had the potential to improve both the work processes, because it would be motivating for pupils to work digitally, as well as improving the product. A clear advantage of using Ms Photo Story 3 is that it is easy to use and it is motivating to work with a combination of speech recordings, music and pictures. Only one of the teachers was negative and said that this was a top-down project staged by the Head Teacher and her management team.

The teachers commented that Ms Photo Story 3 motivated the pupils to work harder and more concentrated, and this was confirmed in interviews with pupils. They explained that they had to work more with their homework because it was time consuming to extract for instance what was relevant information to include in a presentation. In additions, they spent a lot of time finding suitable music and pictures on the net. The main argument for using ICT to improve the work processes, however, is that the pupils experience it as more motivating to work digitally. They listen better when the teacher is using ICT in the introduction and they are willing to spend more time on reading from Internet sites than in a text book and more time constructing digital presentations than the written or oral presentations. In this respect the use of ICT simulates phases in the traditional learning and rehearsing process. This was especially motivating for the less able pupils, a point of view clearly expressed by several of the teachers.

> We have many pupils who never read books, but read on computer pages… Some pupils have never delivered a presentation before but now they have made a Photo Story presentation. In English I can see that the pupils are more motivated and work harder…they learn a lot when they use the Internet… I have seen that pupils who do not like to write now have managed to do their homework and the bright pupils become even better…

> I think the pupils found it great fun to work with Photo Story…It was not at all a problem to motivate them to work. They did not find the software difficult to use and this shows how good they are on the computer…the problem is us - the teachers. We are less ICT-competent and more critical to use of ICT…My pupils were very enthusiastic and even the weaker pupils worked hard and focused if they got some help with finding good sources on the net … by using ICT systems the interest and motivation for my subject has increased.

The presentation of products as a result of homework or in-school projects is perhaps, literally speaking, the most visible and conceivable application of ICT in pupil learning processes and thus an issue most teachers were able to voice opinions about. With a few exceptions the teachers clearly expressed positive attitudes and expectations about the possibility of using ICT tools for improving the presentation of pupil-produced work and the teacher comments were related to both the effects on pupil motivation and the learning process.

> For most of us it is inspiring to use computers when we are working. Being able to present neat products with high esthetical quality such as text and pictures is a source of inspiration and this stimulates efforts and motivation to proceed with and complete work in progress.

The effect of visualization was expected to both improve the learning process of individual pupils by providing feedback from the produced material as the work progressed and in particular by the possibilities offered by using ICT to continuously edit and improve products during the work process. The positive attitudes were apparent with respect to most of the ICT-tools but in particular Digital storytelling and Ms Photo story were used to exemplify the expected positive effects.

Regarding advantages of ICT-based presentations several teachers pointed out that especially for the less confident and more shy pupils the possibility of being able to prepare a presentation at home, using for example Ms Photo Story 3, represented a considerable improvement. These pupils could then run a successful presentation by pressing a button in the classroom and thus avoiding the unpleasant experience of full exposure in a live setting. The teachers also claimed that pupils tended to increase their work load and that the quality of the work is enhanced when ICT is used for presentations of school-work and homework. However one problem raised was that Ms Photo Story 3 presentations were difficult to assess for the teacher and they asked for more training in this field.

More independent pupils?

The question of independent pupils' approach to schoolwork is closely interrelated to and cannot be clearly separated from motivation. If the introduction of ICT in school-based processes leads to higher motivation, it also leads to more autonomous learners and hence more independent approach to school work. But as opposed to the general teacher comment that the less able pupils seem to benefit most from the use of ICT most teachers seemed to believe that when it comes to the degree of independence of pupil approach ICT use will be advantageous for the more able pupils. However the less able pupils are also deemed to benefit, though not to the same extent as the most able pupils.

> Yes to a certain degree, especially with the more able pupils. The less able pupils in my class have also shown an increased interest for the various themes and problems we have worked on in Natural Science classes when they have been allowed to process their knowledge by employing ICT and making use of their ICT competence.

> When the school work is more motivating, the pupils will be more independent, work harder and not require the teacher for pushing the work process. School work is frequently completed in a shorter time. But the pupils nevertheless need supervision and traditional learning.

One of the more fundamental goals of the Norwegian school system, in addition to enhancing subject learning, is to produce independent and critical citizens. If using ICT in schools contributes to this goal, it is clearly interesting. Since the early approaches to introducing ICT-supported learning processes in schools a couple of decades ago, it has been predicted that the educational systems will soon experience a shift of paradigm from traditional knowledge-promoting teaching to a more supervision-based, constructivist learning processes. It was believed that with the introduction of ICT-supported learning processes the days of the traditional teacher were over and the teacher could step aside and concentrate on giving wise and relevant comments to highly motivated pupils involved in more-or-less self-sustainable learning processes. Observations of teachers at work in classrooms and particularly when meeting individual teachers in more informal communication settings confirms that the early predictions of paradigm shifts is far from becoming true. The teachers still want to be in control of the classroom and the learning process at the same time as they see the value of the independent learners. A quote from one of teacher can be used as a representative comment for all the teachers involved:

> As a Maths teacher I don't think the teacher's role has changed with the introduction of ICT. An initial introduction to theory followed up by problem solving is the recipe in Maths. Supervision remains the same, also when tasks where a computer is involved. I believe this is the case for all subjects.

A new learning style?

A frequently re-occurring comment from teachers is also related to the question of whether ICT-based tools as MS Photo Story 3 represent and provide opportunities for new pedagogical methodologies or are merely a support-tool for making traditional teaching more efficient. Teachers gave many enthusiastic comments about the use of, for example, Ms Photo Story 3 but clearly had doubts about whether it would contribute to a change in teaching styles. Attempting to extract what could resemble a kind of common denominator, characterizing teacher attitudes with respect to ICT integration in learning processes for enhanced understanding of subject issues, is not a trivial accomplishment. But throughout the contact with the teacher team during the past two years it is justifiable to claim that all teachers seem to agree that integrating ICT in learning situations in secondary school is clearly beneficial for the less able learners. Pupils who normally are reluctant to get involved in any kind of learning activity seem frequently, but perhaps involuntarily, to be involved in learning-promoting activities when ICT is involved. Most of the teachers involved expressed positive attitudes when asked to elaborate on the potential ICT has for enhancing learning. A frequently used phrase was "*Yes, I believe ICT has a considerable potential for achieving more efficient learning processes and enhanced learning outcome*". However, faced with the question of whether this potential was properly utilized and if any enhancement of learning outcome could be documented by higher grades, all but two of the teachers said that they were unable to present proof in the form of higher grades. The teacher who claimed that progress could be documented by slightly higher grades was careful to emphasize that the changes were marginal and only related to the less- able learners.

Discussion

The results of our research support findings from other recently-conducted research activities in the same field, indicating that the way teachers are adapting to the role as mentors for ICT-supported learning process have the characteristics of an evolutionary process. The observations conducted in the present project revealed an uneven and cumbersome maturing process, metaphorically resembling a rollercoaster ride. Initially the teachers were largely positive to the use of ICT for teaching and learning support, but the main explanation of this phenomenon is most likely that this was considered a "politically correct" attitude at the time. As the project progressed, the level of teacher frustration fluctuated, but signs of a breakthrough or turning point could be observed when the teachers' insight into and comprehension of the potential of ICT as a learning-enhancing artifact gradually became clearer. The teachers gradually developed a more conscious relation to the task of combining ICT-supported learning and alternative pedagogical approaches. In particular, our investigations indicate that conducting the learning process by applying ICT in a knowledge creation perspective will contribute considerably to the utilization of ICT as a learning-enhancing artifact.

Attempting to implement ICT-supported learning processes, with the objective of enhancing subject-learning outcome but disregarding the necessity of a careful integration of pedagogy and technology, has also been criticized in other recently- published research reports (Passey, 2006, Watson 2001, Cordon et al 2007). Insufficient integration of pedagogy and ICT is claimed to be one of the main factors explaining the failures of achieving enhanced subject-learning outcome as a result of ICT-supported learning processes. Throughout the school systems, ICT is commonly used for increasing motivation among learners but rarely used for achieving the internalization of new knowledge. According to Passey (2006) long-term positive effects on learning outcome cannot be expected unless ICT is actively used for stimulating the learner's internal learning processes. Using MS Photo Story 3 as a presentation tool has a potential to inspire and motivate the pupils to work harder and in this way it might enhance the learning outcome, according to the teachers.

Evidence from a number of research investigations indicates that subject attainment depends on the teacher's ability to identify suitable affordances and consciously plan for pupil learning with ICT as well as providing appropriate support during lessons. By approaching ICT-supported learning in a knowledge creation perspective, the present project places its main emphasis on ensuring that the teachers plan and implement learning processes in a way which stimulates knowledge creation.

During the first part of the project we gained insight in the teachers' situations and recognized that the teachers' lack of general ICT competence and confidence made it difficult to investigate the learning potential of ICT. Initially insufficient ICT competence among the participating teachers has considerably hampered the utilization of the ICT's learning potential and necessitated more intense teacher training. In accord with results from other research projects (Webb & Cox 2004; Watson 1993) we found that the teachers needed a deeper understanding of the nature of ICT resources in general and the use of digital presentation resources and their potential for supporting learning processes in particular. At the present stage of the research project we can conclude that a significant explanation of some of the teachers' lack of enthusiasm for integrating ICT into classroom teaching activities is that the role of ICT is still narrowly regarded as a simple technological tool and not as an artefact in a broader sense. Bringing about a change with respect to the role of ICT may, to a considerable degree, change the way schools and classroom-learning function as well as the role of teachers and learners.

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